

REMARKS

Reconsideration of the January 24, 2003 Official Action is respectfully requested.

Claims 1 and 14 have been amended to include a lower limit of Al of more than 0.01%. New Claims 35 and 37 depend from Claims 1 and 14, respectively, and recite a lower limit of Al of at least 0.015%. New Claims 36 and 38 depend from Claims 1 and 14, respectively, and recite a lower limit of Al of at least 0.020%. The amendments to Claims 1, 14 and the aluminum contents recited in Claims 35-38 are supported by the original disclosure which recites an upper limit of Al of 0.080% (see specification at page 8, lines 22-26). Further, Table 1 on page 16 of the specification sets forth various examples of Al contents ranging from 0.023 to 0.038%. Accordingly, because the specification discloses values of Al of up to 0.080% and provides examples ranging from 0.023 to 0.038%, it is submitted that no new matter has been added.

Applicants hereby affirm the election of the invention of Group I, i.e., Claims 1-26. The new claims are directed to the elected invention. Applicants reserve the right to file a divisional application directed to the subject matter of Claims 27-34.

Claims 1-26 were rejected under 35 USC §103(a) over Japanese Publication No. 2000-144330 ("Japan '330"), U.S. Patent No. 3,950,191 ("Ito") and Japanese Patent Publication No. 11-279721 ("Japan '721"). The reasons for the rejection are set forth on pages 3-4 of the Official Action. This rejection is respectfully traversed for the following reasons.

In the rejection, it is stated that "[t]he English abstract of JP '330A, Ito et al. in Table 1 of columns 8 to 10, and the English abstract of JP '721, each teach an ultra-low carbon steel sheet which meets the claimed composition, and has an extremely low number of oxide inclusions" (Official Action at page 3). The Official Action acknowledges that the cited references do not disclose "20 or less inclusions in 60 fields under a microscope in a sample steel prepared in accordance with JIS G0555 as recited by the claim . . . [but alleges that] the low number of 20 would be inherently suggested by prior art since similar to the present invention, the prior art desires and seeks to have extremely low numbers of inclusions in order to reduce surface defects, such as pin holes and press cracks" (Official Action at pages 3-4). As explained below, it is submitted that the cited references fail to suggest the claimed invention.

Claim 1 sets forth an ultra-low carbon steel having a chemical composition including, in mass percent, C: at most 0.010%, Si: at most 0.5%, Mn: at most 1.5%, P: at most 0.12%, S: at most 0.030%, Al: more than 0.01%, and at most 0.080%, N: at most 0.0080%, one or both of Ti: at most 0.10% and Nb: at most 0.05%, B: 0 - 0.0050%, V: 0 - 0.05%, Ca: 0 - 0.0050%, and at most 0.1% of each of Cu, Cr, Sn, and Sb as unavoidable components, wherein the total number of non-metallic inclusions observed in 60 fields under a microscope in a sample of the steel prepared in accordance with JIS G0555 is at most 20. The combination of features recited in Claim 1 is not suggested by the cited references.

Claim 14 sets forth an ultra-low carbon steel sheet made of a steel having a chemical composition including, in mass percent, C: at most 0.010%, Si: at most 0.5%, Mn: at most

1.5%, P: at most 0.12%, S: at most 0.030%, Al: more than 0.01%, and at most 0.080%, N: at most 0.0080%, one or both of Ti: at most 0.10% and Nb: at most 0.05%, B: 0 - 0.0050%, V: 0 - 0.05%, Ca: 0 - 0.0050%, and at most 0.1% of each of Cu, Cr, Sn, and Sb as unavoidable components, wherein the total number of non-metallic inclusions observed in 60 fields under a microscope in a sample of the steel prepared in accordance with JIS G0555 is at most 20. The combination of features recited in Claim 14 is not suggested by the cited references.

Japan '330 discloses carbon steels containing 0.001-0.2% C, 0.01-0.5% Mn, 0.001-0.5% Si, 0.001-0.3% P, 0.0005-0.05% S, 0.006 or less of Al, 0.005-0.06% Ti, 0.0005-0.01% Ca, 0.0005-0.01% N, 0.0005-0.005% O, and remainder iron and unavoidable impurities (Abstract of Japan '330). Accordingly, Japan '330 specifically teaches a maximum Al content of 0.006%. As such, Japan '330 teaches away from the steel compositions recited in Claims 1 and 14 which require more than 0.01% Al.

Ito discloses steel sheets having not more than 0.020% C, not more than 0.03% Si, not more than 0.50% Mn, not more than 0.010% Al, not more than 0.050% O, and B within a range of 0.003-0.020% such that BxO is more than 1×10^{-5} and the remainder being inevitable impurities and iron (Abstract of Ito). Ito states that when the Al content increases the nonmetallic inclusions of Al_2O_3 are exposed on the steel sheet surface and the surface properties are not only deteriorated but also defects of fish scale, pin hole and the like are caused in the exposed inclusion portion after enameling (column 3, lines 60-65 of Ito). Ito therefore states that the upper limit of 0.01% Al "is necessary" (sentence bridging

columns 3-4 of Ito). In Table 1 of Ito, for the steels according to the invention, the Al contents range from 0.003 to 0.009%. Accordingly, Ito teaches away from the claimed steel compositions recited in Claims 1 and 14.

Japan '721 discloses a steel sheet having 0.0002-0.0080% C, 0.001-0.04% Si, 0.05-1.0% Mn, 0.001-0.050% P, 0.001-0.030% S, 0.001-0.005% Sol. Al, 0.0005-0.0080% N and 0.004-0.030% Ti, the balance iron and inevitable impurities (Abstract of Japan '721). Accordingly, Japan '721 teaches away from the steel compositions recited in Claims 1 and 14.

It is submitted that the differences between the claimed subject matter and the prior art are such that the claimed subject matter, as a whole, would not have been obvious at the time the invention was made to a person having ordinary skill in the art.

In view of the foregoing, it is submitted that the present application is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: June 13, 2003

By: _____



Peter K. Skiff

Registration No. 31,917

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620